provided that the aryl group for R^1, R^3 and R^5 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, $-CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino;

provided that the heterocyclic group for R^5 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, $-CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino; and

provided that the heterocyclic group for R^4 and R^5 is selected from the group consisting of pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl and benzimidazolyl.

REMARKS

As a result of the foregoing amendment, Claims 22, 28 and 32-35 have been amended. Claims 22-36 are pending in this application.

In the Office Action mailed May 7, 2001, the Examiner has rejected Claims 22-35 as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, the Examiner asserts that the present claims are not enabled for the scope of compounds provided by the term "heterocyclic" in the definitions of R^3, X and Y^1 constituents. In response to this rejection, Applicants have hereinabove amended independent Claims 22, 28 and 32-35 to provide that the heterocyclic group is selected from the group consisting of pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl and benzimidazolyl. Support for this amendment can be found in the specification at page 8, lines 29-33; page 9, lines 16-20; page 16, lines 18-19; and page 17, lines 6-7.

Also in the Office Action, the Examiner has rejected Claims 22-35 as being indefinite. In particular, the Examiner asserts that the terms "comprising," "heterocyclic," "carbamoyl" and "acyl" are open-ended. In response to this rejection, Applicants have hereinabove amended independent Claims 22, 28 and 32-35 to delete the term "comprising" and substitute therefor the recitation "consisting of" as suggested by the Examiner.

Applicants have also hereinabove amended independent Claims 22, 28 and 32-35 to more particularly define the terms "heterocyclic," "carbamoyl" and "acyl." As stated above, the heterocyclic group has been limited to be pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl or benzimidazolyl. Further, the term "carbamoyl" has been replaced with a carbamoyl which has no substituents, "-CONH2." In addition, the recitation "an acyl group..." has been deleted and the recitation "acetoxy

group, a benzoyloxy group" has been substituted therefor to more particularly define the acyl group. Support for this amendment can be found in the specification at page 14, lines 27 (Compound No. 22) and 28 (Compound No. 23).

In addition, the Examiner asserts that the recitation "bone diseases" in Claims 32 and 34 is indefinite. In response to the Examiner's assertions, Applicants have hereinabove amended Claims 32 and 34 to define "bone diseases" to be osteoporosis, malignant hypercalcemia and Paget's Disease. Support for this amendment can be found in the specification at page 2, lines 20-24.

Applicants have also enclosed herewith a copy of Claims 22, 28 and 32-35 as they existed prior to this Amendment with the changes shown by brackets and underlines. No new matter has been added in amended Claims 22, 28 and 32-35.

In view of the foregoing, it is respectfully submitted that the claims as amended are in condition for allowance and favorable reconsideration and prompt notice to that affect are earnestly solicited.

Respectfully submitted,
REED SMITH, LLP

September 7, 2001

By: _____

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375 Park Avenue
New York, NY 10152
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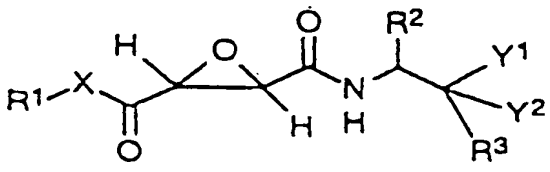
JEG/SRP/SC:ss

MARKED-UP COPY OF CLAIMS 22, 28 AND 32-35

22. (Amended) An epoxysuccinamide derivative having the following formula (1) and its physiologically acceptable salt:



(1)

wherein

R^1 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^2 represents an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^3 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

X represents -O- or $-NR^4-$ in which R^4 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6

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carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

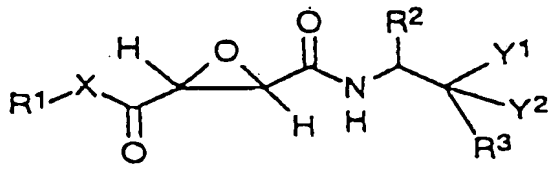
Y^1 represents a hydroxyl group, an alkoxy group having 1 to 6 carbon atoms, an acetoxy group, or an aralkyloxy group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms; and

Y^2 represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms;

provided that the aryl group for R^1 to R^4 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxy-carbonyl having 2-7 carbon atoms, [carbamoyl] $-CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino[.]; and

provided that the heterocyclic group for R^3 and R^4 is selected from the group consisting of pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl and benzimidazolyl.

28. (Twice Amended) An epoxysuccinamide derivative having the following formula (1) and its physiologically acceptable salt:



(1)

wherein

R^1 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^2 represents an isobutyl group or an isopropyl group;

R^3 represents a hydrogen atom or an aryl group having 6 to 20 carbon atoms;

X represents -O- or $-NR^4-$ in which R^4 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

Y^1 represents OR^5 in which R^5 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, [an acyl group having 2 to 20 carbon atoms] an acetoxy group, a benzoyloxy group, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms; and

Y^2 represents a hydrogen atom;

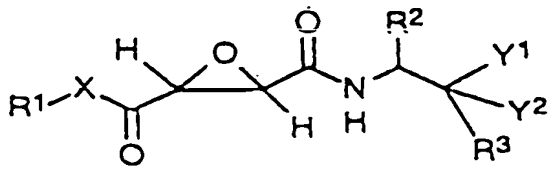
provided that the alkyl group for R^5 may have one or more substituents selected from the group consisting of hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] $-CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, and guanidino;

provided that the aryl group for R^1, R^3 and R^5 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino; [and]

provided that the heterocyclic group for R^5 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino[.]; and

provided that the heterocyclic group for R^3, R^4 and R^5 is selected from the group consisting of pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl and benzimidazolyl.

32. (Amended) A method for treating a bone [diseases which comprises] disease selected from the group consisting of osteoporosis, malignant hypercalcemia and Paget's disease, the method comprising injecting or orally administering into a patient an epoxysuccinamide derivative having the following formula (1) and its physiologically acceptable salt in an amount of 0.01 to 100 mg/day in the case of injection or in an amount of 0.1 mg/day to 1 g/day in the case of oral administration:



(1)

wherein

R^1 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^2 represents an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^3 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

X represents -O- or -NR^4- in which R^4 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

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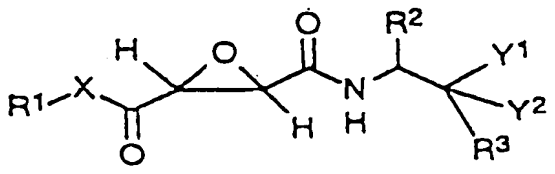
Y^1 represents a hydroxyl group, an alkoxy group having 1 to 6 carbon atoms, an acetoxy group, or an aralkylaxy group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms; and

Y^2 represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms;

provided that the aryl group for R^1 to R^4 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino[.]; and

provided that the heterocyclic group for R^3 and R^4 is selected from the group consisting of pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl and benzimidazolyl.

33. (Amended) A method for treating arthritis which comprises injecting or orally administering into a patient an epoxysuccinamide derivative having the following formula (1) and its physiologically acceptable salt in an amount of 0.01 to 100 mg/day in the case of injection or in an amount of 0.1 mg/day to 1 g/day in the case of oral administration:



(1)

wherein

R^1 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl

group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^2 represents an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^3 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms[,];

X represents -O- or $-NR^4-$ in which R^4 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

Y^1 represents a hydroxyl group, an alkoxy group having 1 to 6 carbon atoms, an acetoxy group, or an aralkyloxy group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms; and

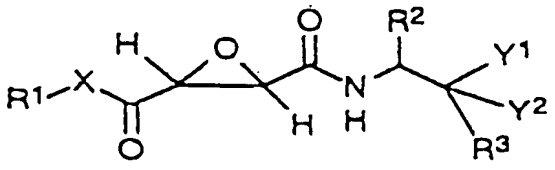
Y^2 represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms;

provided that the aryl group for R^1 to R^4 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino

having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxy-carbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylamino-carbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino[.]; and

provided that the heterocyclic group for R^3 and R^4 is selected from the group consisting of pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl and benzimidazolyl.

34. (Twice Amended) A method for treating a bone [diseases which comprises] disease selected from the group consisting of osteoporosis, malignant hypercalcemia and Paget's disease, the method comprising injecting or orally administering into a patient an epoxysuccinamide derivative having the following formula (1) and its physiologically acceptable salt in an amount of 0.01 to 100 mg/day in the case of injection or in an amount of 0.1 mg/day to 1 g/day in the case of oral administration:



(1)

wherein

R^1 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^2 represents an isobutyl group or an isopropyl group;

R^3 represents a hydrogen atom or an aryl group having 6 to 20 carbon atoms;

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X represents -O- or -NR^4- in which R^4 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

Y^1 represents OR^5 in which R^5 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, [an acyl group having 2 to 20 carbon atoms] an acetoxy group, a benzoyloxy group, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms; and

Y^2 represents a hydrogen atom;

provided that the alkyl group for R^5 may have one or more substituents selected from the group consisting of hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, and guanidino;

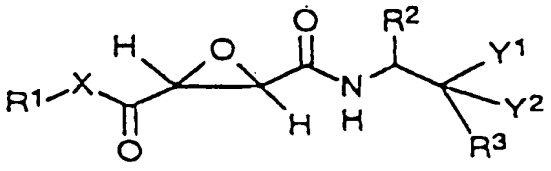
provided that the aryl group for R^1, R^3 and R^5 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having

2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino; [and]

provided that the heterocyclic group for R^5 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino[.]; and

provided that the heterocyclic group for R^4 and R^5 is selected from the group consisting of pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl and benzimidazolyl.

35. (Twice Amended) A method for treating arthritis which comprises injecting or orally administering into a patient an epoxysuccinamide derivative having the following formula (1) and its physiologically acceptable salt in an amount of 0.01 to 100 mg/day in the case of injection or in an amount of 0.1 mg/day to 1 g/day in the case of oral administration:



(1)

wherein

R^1 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, or an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

R^2 represents an isobutyl group or an isopropyl group;

R^3 represents a hydrogen atom or an aryl group having 6 to 20 carbon atoms;

X represents -O- or -NR^4- in which R^4 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms;

Y^1 represents OR^5 in which R^5 is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group [comprising] consisting of an aryl group having 6 to 20 carbon atoms and an alkyl group having 1 to 6 carbon atoms, [an acyl group having 2 to 20 carbon atoms] an acetoxy group, a benzoyloxy group, a heterocyclic group having 3 to 12 carbon atoms, or a heterocyclic-alkyl group [comprising] consisting of a heterocyclic group having 3 to 12 carbon atoms and an alkyl group having 1 to 6 carbon atoms; and

Y^2 represents a hydrogen atom;

provided that the alkyl group for R^5 may have one or more substituents selected from the group consisting of hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, and guanidino;

provided that the aryl group for R^1, R^3 and R^5 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl,

alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino; [and]

provided that the heterocyclic group for R^5 may have one or more substituents selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyl, amino, alkylamino having 1-6 carbon atoms, dialkylamino having 2-12 carbon atoms in total, alkoxy having 1-6 carbon atoms, halogen, haloalkyl having 1-6 carbon atoms, cyano, nitro, carboxyl, alkoxycarbonyl having 2-7 carbon atoms, [carbamoyl] -$CONH_2$, alkylaminocarbonyl having 2-7 carbon atoms, dialkylaminocarbonyl having 3-13 carbon atoms in total, amidino, and guanidino[.]; and

provided that the heterocyclic group for R^4 and R^5 is selected from the group consisting of pyridyl, pyrrolidinyl, piperidinyl, furyl, thienyl, piperazinyl, indolyl and benzimidazolyl.